

Amendment
Serial No. 10/091,050

Docket No. DE010063

IN THE CLAIMS:

Kindly replace the claims of record with the following full set of claims:

1. (Currently amended) A method of segmenting a three-dimensional structure, which is contained in an object, from at least one two-dimensional image (I_1, I_2) which represents a slice of the object, the method utilizing a deformable model (M) whose surface is formed by a network of meshes which interconnect network points on the surface of the model, and which method includes the steps of:
 - a) determining the meshes (T_3, T_4) which intersect the image (I_1, I_2),
 - b) searching, for each mesh determined in the step a), a respective structure point (x_{is}), situated on the surface of the structure, along a search line $(n_i)_s$ which traverses the mesh, ~~and extends along a line n_i which extends in the image plane I and whose direction corresponds to the direction of the projection of the normal n on the image plane $I[[.]]$, wherein the projection of the normal and the normal n itself are situated in a plane extending perpendicularly to the image plane I and perpendicularly to line segments of the meshes which intersect the image,~~
 - c) calculating anew the network points (x_{im}) of the model (M) on the basis of the structure points (x_{is}) found, and
 - ~~d) repeating the steps a) to c) a number of times on the basis of the newly calculated network points.~~
2. (Original) A method as claimed in claim 1, in which the direction of the search line (n_i) corresponds to the projection of a line perpendicular to the mesh onto the plane of the

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image.

3. (Original) A method as claimed in claim 1, in which the search for a structure point is limited to a zone of the search line which is symmetrically situated relative to the line of intersection (h) of the mesh and the plane of the image.

4. (Original) A method as claimed in claim 1, in which the search lines extend through the centers of the lines of intersection of the meshes and the plane of the image.

5. (Currently amended) An image processing device which includes:

a memory for storing a deformable model whose surface is formed by a network of meshes which interconnect network points on the surface of the model, and for storing at least one two-dimensional image which represents a slice of an object,

an image display unit for displaying a segmented structure, and

image processing means for segmenting a three-dimensional structure which is contained in the object, which segmentation operation comprising the steps of:

a) determining the meshes which intersect the image,

b) searching, for each mesh determined in the step a), a respective structure point, situated on the surface of the structure, along a search line which traverses the mesh and extends along a line n_i which extends in the image plane I and whose direction corresponds to the direction of the projection of the normal n on the image plane I[[.]],
wherein the projection of the normal and the normal n itself are situated in a plane extending perpendicularly to the image plane I and perpendicularly to line segments of

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the meshes which intersect the image,

c) recalculating the network points of the model on the basis of the structure points found, and

~~— d) repeating the steps a) to c) a number of times on the basis of the newly calculated network points.~~

6. (Currently amended) A computer program for an image processing unit for segmenting a three-dimensional structure, which is contained in an object, from at least one two-dimensional image which represents a slice of the object, which computer program utilizes a deformable model whose surface is formed by a network of meshes which interconnect network points on the surface of the model, and which computer program provides instruction to a computing system to execute the steps of:

a) determining the meshes which intersect the image,

b) searching, for each mesh determined in the step a), a respective structure point, situated on the surface of the structure, along a search line which traverses the mesh and extends along a line n_i which extends in the image plane I and whose direction corresponds to the direction of the projection of the normal n on the image plane I $[[.]$], wherein the projection of the normal and the normal n itself are situated in a plane extending perpendicularly to the image plane I and perpendicularly to line segments of the meshes which intersect the image,

c) calculating anew the network points of the model on the basis of the structure points found, and

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~~— d) repeating the steps a) to c) a number of times on the basis of the newly
calculated network points.~~

7. (New) The image processing device as claimed in claim 5, further comprising the
step of:

d) repeating the steps a) to c) a number of times on the basis of the newly
calculated network points.

8. (New) The computer program as claimed in claim 6, further providing instruction
to a computing system to execute the step of:

d) repeating the steps a) to c) a number of times on the basis of the newly
calculated network points.

9. (New) The method as claimed in claim 1, further comprising the step of:

d) repeating the steps a) to c) a number of times on the basis of the newly
calculated network points.